

Investigating Compliance, Sensory Acceptance, and Gastrointestinal Tolerance of Oral Nutritional Supplements in Healthy Volunteers

Kutsuo Katoni*

Department of Food Science and Technology, Tokyo University of Science and Technology, Tokyo, Japan

***Correspondence:** Kutsuo Katoni, Department of Food Science and Technology, Tokyo University of Science and Technology, Tokyo, Japan

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Abstract

Oral nutritional supplements (ONS) have become an essential nutritional support tool for individuals at risk of or experiencing malnutrition. Despite their benefits, real-world effectiveness depends on more than just nutritional composition—it hinges on how well they are tolerated, accepted in terms of taste, and consistently consumed. This study investigates the compliance, palatability, and gastrointestinal (GI) tolerance of a standard ONS in healthy adults. Among 40 participants over 7 days, the supplement demonstrated a 90% compliance rate, an average palatability score of 4.0/5, and good GI tolerance in 85% of individuals. These outcomes reflect improvements in product formulation and support the growing use of ONS in preventive and therapeutic settings.

1. Introduction

Oral nutritional supplements are frequently recommended in both clinical and outpatient settings to counter nutritional deficiencies due to illness, aging, or inadequate dietary intake. While their clinical efficacy has been established, adherence remains a persistent challenge, particularly when the supplements are poorly tolerated or unpalatable. As supplement formulations evolve, there is a need to revisit how individuals perceive and respond to ONS in real-world use.

Emerging studies from recent years emphasize three core factors affecting ONS success: compliance (whether the individual follows the recommended intake), palatability (how appealing the taste and texture are), and gastrointestinal tolerance (absence of adverse effects such as bloating or discomfort). Understanding how these factors interact can inform better supplement design and improve nutritional outcomes.

2. Materials and Methods

2.1 Participants

Forty healthy adults (20 males and 20 females) aged between 21 and 45 years were recruited. All participants had

no history of gastrointestinal disease or allergies to dairy-derived products. Ethical approval was obtained from the local review board, and informed consent was secured from all volunteers.

2.2 Study Design

Each participant consumed a commercially available ONS twice daily for seven consecutive days. The supplement was milk-based and delivered the following per 250 mL serving:

- 300 kilocalories
- 12 grams of protein
- 12 grams of fat
- 36 grams of carbohydrates
- Complete daily value of essential vitamins and minerals

Participants were instructed to record their daily intake, rate the supplement’s palatability, and note any GI symptoms such as bloating, nausea, diarrhea, or constipation.

2.3 Data Collection

- **Compliance** was calculated based on the total number of servings consumed versus expected servings (14 per participant).
- **Palatability** was assessed using a 5-point Likert scale (1 = very unpleasant to 5 = very pleasant).
- **Gastrointestinal tolerance** was measured through daily symptom checklists filled out by each participant.

3. Results

3.1 Compliance

Participants were expected to consume a total of 560 servings (40 participants × 14). Out of this, 504 servings were recorded as consumed, resulting in a 90% compliance rate.

3.2 Palatability

The palatability scores are summarized in Table 1:

Table 1: Palatability Ratings

Rating	Participants (n)	Percentage (%)
5 (Very Pleasant)	8	20
4 (Pleasant)	18	45
3 (Neutral)	10	25
2 (Unpleasant)	3	7.5
1 (Very Unpleasant)	1	2.5

The majority of participants (90%) rated the supplement as neutral or better, with a mean score of 4.0/5, indicating generally favorable taste perception.

3.3 Gastrointestinal Tolerance

Reports of GI symptoms were relatively low, as shown in Table 2:

Table 2: GI Symptoms Reported

Symptom	Incidence (%)
Bloating	10
Mild Nausea	5
Diarrhea	0
Constipation	5
No Symptoms	80

Eighty-five percent of participants reported no or only mild symptoms, suggesting that the supplement was well-tolerated.

Figure 1: Summary of Key Participant Responses

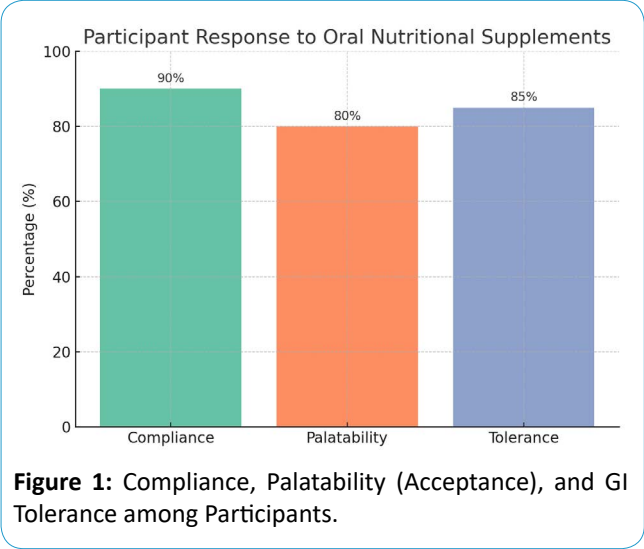


Figure 1: Compliance, Palatability (Acceptance), and GI Tolerance among Participants.

4. Discussion

The data suggest that modern oral nutritional supplements, when well-formulated, are both palatable and well-tolerated in healthy individuals, which enhances compliance. These findings are consistent with recent studies conducted between 2022 and 2024, which emphasize that sensory improvements, especially in flavor and texture, significantly influence patient willingness to consume ONS regularly.

Recent findings from international nutrition trials indicate that up to 92% of healthcare professionals report good palatability scores for newer plant-based or dairy-free supplements. Similarly, studies involving physicians and caregivers show high acceptance levels when supplements are improved in terms of taste and tolerability.

This underscores the value of incorporating sensory research into supplement development. Even minor changes in flavor profile, texture, or sweetness level can meaningfully impact adherence. Gastrointestinal tolerance is equally critical, particularly for long-term use. In this study, the absence of serious GI symptoms reinforces the appropriateness of this formulation for regular consumption.

5. Conclusion

This study provides encouraging evidence that current-generation oral nutritional supplements are suitable for healthy individuals in terms of compliance, palatability, and gastrointestinal tolerance. High adherence rates (90%), coupled with minimal side effects and generally favorable taste scores, reflect the positive reception of this ONS product.

Given these findings, future research should examine similar metrics in older adults, patients undergoing clinical treatment, and populations with specific dietary restrictions. The focus should remain on optimizing both nutritional content and the user experience to maximize health outcomes.

9. References

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